

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) Telephone line diagnostic equipment for use with a loop test server, the equipment comprising:

a frequency shift key (FSK) data detector configured for connection to a telephone line, wherein the data detector is configured to detect data encoded in accordance with the GR-30 standard provided on the telephone line and to provide signals representing the detected data at an output;

a telephone line terminator configured for connection to the telephone line, wherein the telephone line terminator terminates the telephone line in response to a termination signal received at an input, thereby causing an off-hook condition, and wherein the telephone line terminator is configured to reflect test signals sent by the loop test server over the telephone line back over the telephone line during the off-hook condition;

and a processor connected to the output of the data detector and the input of the telephone line terminator, wherein the processor monitors the signals provided at the output of the data detector for a Loop Test Message from the loop test server and provides a termination signal to the input of the telephone line terminator in response to the receipt of the Loop Test Message, wherein the Loop Test Message includes data other than caller-identification data of the loop test server.

2 and 3. (Cancelled)

4. (Original) The equipment of claim 1 wherein the telephone line terminator comprises a resistor and a relay configured to terminate the telephone line with the resistor when the relay is energized by the termination signal.

5. (Original) The equipment of claim 1 wherein the processor is a microprocessor.

6. (Original) The equipment of claim 1 wherein the processor monitors duration of the termination signal to the input of the telephone line terminator.

7. (Original) The equipment of claim 6 wherein the processor ends the termination signal if the duration of the termination signal exceeds a predetermined length of time.

8. (Original) The equipment of claim 1 wherein the processor monitors the signals provided at the output of the data detector for a Stop Test Message and ends the termination signal to the input of the telephone line terminator in response to the receipt of the Stop Test Message.

9. (Original) The equipment of claim 1 further comprising a voltage detector configured for connection to the telephone line, wherein the voltage detector is configured to detect the voltage level the telephone line and to provide signals representing the voltage level at an output, and wherein the processor monitors the signals provided at the output of the voltage detector.

10. (Original) The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator in response to a signal representing an open switching interval provided at the output of the voltage detector.

11. (Original) The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator in response to a signal representing an extension telephone device going off-hook provided at the output of the voltage detector.

12. (Original) The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator when the output of the voltage detector indicates that the voltage level has dropped by more than 5% or 500mV, whichever is greater.

13. (Original) The equipment of claim 9 further comprising a dual tone multi-frequency (DTMF) generator connected at an input to the processor, and configured for connection to the telephone line, wherein the DTMF generator provides DTMF signals on the telephone line in response to signals received at the input from the processor.

14. (Original) The equipment of claim 13 wherein the processor causes the DTMF generator to send DTMF signals in response to a signal representing an extension telephone device going off-hook provided at the output of the voltage detector.

15. (Original) The equipment of claim 13 wherein the processor causes the DTMF generator to send DTMF signals when the output of the voltage detector indicates that the voltage level has dropped by more than 5% or 500mV, whichever is greater.

16. (Previously Presented) A method for evaluating a telephone line between a central location and a customer premises, the method comprising:

detecting data provided on the telephone line at the customer premises;

sending a Loop Test Message on the telephone line from the central location;

in response to a detected Loop Test Message on the telephone line at the customer premises, terminating the telephone line to cause an off-hook condition

while the telephone line at the customer premises is off-hook, sending test signals from the central location on the telephone line, and receiving at the central location signals reflected back on the telephone line from the customer premises.

17. (Cancelled)

18. (Previously Presented) The method of claim 16 wherein the test signals are signals at a range of frequencies.

19. (Original) The method of claim 18 further comprising the step of performing a return loss measurement at the range of frequencies to determine aspects of the frequency response of the telephone line.

20. (Currently Amended) A telephony apparatus comprising:

detecting means, connected to a telephone line, for detecting a Loop Test Message signal sent by a remote loop testing server, wherein the Loop Test Message includes data encoded in accordance with the GR-30 standard other than caller-identification data of the remote loop testing server;

central processing means, connected to said detecting means, for measuring the time the loop test is activated;

hook switch means, connected to said central processing means, for terminating the telephone line during the loop test in response to the detection of the Loop Test Message by the detecting means, and for reflecting test signals sent over the telephone line by the remote loop testing server back over the telephone line during the loop test;

voltage detecting means, connected to said central processing means, for measuring the voltage on the telephone line in order to determine if an extension telephone device is off-hook.

21. (Original) The telephony apparatus of claim 20 further comprising a telephone set, and wherein the loop test apparatus is included within the telephone set.

22. (Original) The telephony apparatus of claim 20 further comprising a Caller ID device, and wherein the loop test apparatus is included within the Caller ID device.

23. (Original) The telephony apparatus of claim 20 further comprising a computer modem, and wherein the loop test apparatus is included within the computer modem.

24. (Original) The telephony apparatus of claim 20 further comprising a computer-telephony interface board, and wherein the loop test apparatus is included within the computer-telephony interface board.

25. (Original) The telephony apparatus of claim 20 further comprising a telephone answering device, and wherein the loop test apparatus is included within the telephone answering device.

26. (Currently Amended) A method of interfacing with a loop test server comprising:
detecting a Loop Test Message signal sent by the loop test server, wherein the Loop Test Message includes data encoded in accordance with the GR-30 standard other than caller-identification data of the loop test server;

detecting if extension telephone devices are off-hook;

in response to the receipt of a Loop Test Message, terminating the telephone line with an impedance in order to connect the call back to the loop test server and reflecting test signals sent over the telephone line by the loop test server back over the telephone line;

measuring the duration of the loop test.

27. (Original) The method of claim 26 wherein the method is performed by a telephone set.

28. (Original) The method of claim 26 wherein the method is performed by a caller ID device.

29. (Original) The method of claim 26 wherein the method is performed by a computer modem.

30. (Original) The method of claim 26 wherein the method is performed by a computer-telephony interface board.

31. (Original) The method of claim 26 wherein the method is performed by a telephone answering device.

32. (New) A system for evaluating a telephone line having a first end and a second end, the system comprising:

a loop test server comprising:

a Loop Test Message generator configured for communication with the first end of the telephone line, wherein the Loop Test Message generator generates a Loop Test Message that includes data encoded in accordance with the GR-30 standard other than caller-identification data of the loop test server;

a test signal generator configured for communication with the first end of the telephone line;

a diagnostic device comprising:

a data detector configured for communication with the second end of the telephone line, wherein the data detector is configured to detect data encoded in accordance with the GR-30, and to provide signals representing the detected data at an output;

a telephone line terminator configured for communication with the second end of the telephone line, wherein the telephone line terminator terminates the second end of the telephone line in response to a termination signal received at an input, thereby causing an off-hook condition, and wherein the telephone line terminator is configured to reflect test signals sent by the test signal generator of the loop test server and received at the second end of the telephone line back over the telephone line during the off-hook condition;

and a processor configured for communication with the output of the data detector and the input of the telephone line terminator, wherein the processor monitors the signals provided at the output of the data detector for a Loop Test Message from the Loop Test Message generator of the loop test server, and provides a termination signal to the input of the telephone line terminator in response to the receipt of the Loop Test Message.

33. (New) The system of claim 32 wherein the test signal generator generates test signals over a range of frequencies.

34. (New) The system of claim 33 wherein the loop test server further comprises an analyzer configured to perform a return loss measurement at the range of frequencies to determine aspects of the frequency response of the telephone line.